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# Physician self-referral and physician-owned specialty facilities

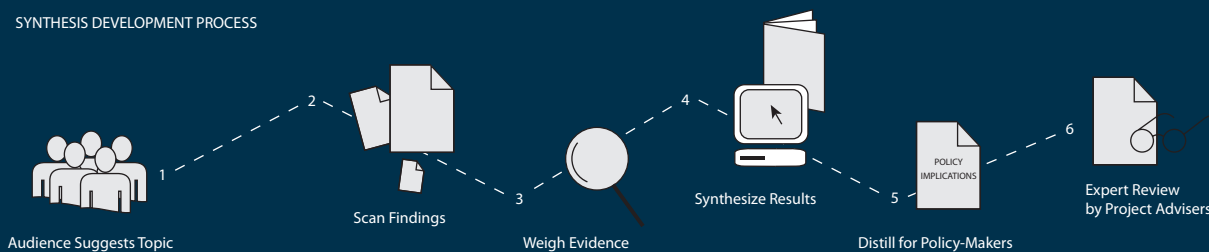
See companion Policy Brief available at [www.policysynthesis.org](http://www.policysynthesis.org)

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**THE SYNTHESIS PROJECT** (Synthesis) is an initiative of the Robert Wood Johnson Foundation to produce relevant, concise, and thought-provoking briefs and reports on today's important health policy issues. By synthesizing what is known, while weighing the strength of findings and exposing gaps in knowledge, Synthesis products give decision-makers reliable information and new insights to inform complex policy decisions. For more information about the Synthesis Project, visit the Synthesis Project's Web site at [www.policysynthesis.org](http://www.policysynthesis.org). For additional copies of Synthesis products, please go to the Project's Web site or send an e-mail request to [pubsrequest@rwjf.org](mailto:pubsrequest@rwjf.org).

### SYNTHESIS DEVELOPMENT PROCESS



## Introduction

Physician self-referral is ubiquitous. Self-referral occurs each time a physician asks a patient to return for an appointment, refers a patient to another colleague within the physician's own medical group or refers a patient for a service (e.g., laboratory test, imaging study or surgical procedure) in a facility with which the physician has a financial relationship.

These examples make it apparent that it would be neither possible nor desirable to ban all forms of self-referral. Self-referral may be convenient for patients and may lead to better coordinated, more efficient, higher-quality care. On the other hand, self-referral involves physicians in two forms of conflict of interest: first, the physician has a financial incentive to recommend additional services—including services that may not be necessary—to patients. Second, the physician has a financial incentive to suggest patients have services in a facility with which the physician has a financial relationship and the quality of care provided at this facility may not be equal to that of other facilities in the area. Additionally, self-referral may give self-referring physicians an unfair competitive advantage over hospitals because of physicians' ability to steer patients to their own facilities.

In 1989, responding to research that showed physicians who owned physical therapy or laboratory facilities referred patients for these services at much higher rates than other physicians (83), Congress passed the "Stark Law" to regulate self-referral.<sup>1</sup> This law covered a limited range of services and prohibited physicians from referring Medicare patients for these services to facilities with which they have an ownership or compensation relationship (46, 76).<sup>2</sup> Since that time, physician self-referral has remained a controversial topic. Congress modified the Stark law to cover a wider range of services and the Centers for Medicare and Medicaid Services (CMS) has been engaging in an arduous, ongoing process of translating the laws into regulations—an effort that continues at present (35, 46, 73, 76, 84).<sup>3</sup> The Stark regulations prohibit self-referral for a broad range of "designated health services," but allow certain important exceptions: notably, physicians are permitted to self-refer for designated health services performed within their own offices and within ambulatory surgery centers and hospitals that they own.<sup>4</sup>

Recently, interest in physician self-referral has heightened, primarily because of the rapid growth of physician-owned specialty hospitals and ambulatory surgery centers (ASCs), and of diagnostic imaging performed in physician offices and in imaging facilities (Independent Diagnostic Testing Facilities (IDTFs)) with which physicians have a financial relationship (21, 37, 44, 45). Self-referral for surgical and endoscopic procedures performed within physician offices is also emerging as an issue. This report will address together the issues of physician self-referral and the growth of these facilities and services. Indeed, they cannot be adequately addressed separately: self-referral always occurs within an organizational context. Moreover, the effects on health care quality and costs of physician-owned specialty hospitals and ASCs, of imaging services and procedures provided in physician offices, and of physician referrals to IDTFs, depend both on self-referral and on the characteristics of these facilities.

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1 Section 1877 of the Social Security Act. Many states have also enacted laws governing physician self-referral; these typically resemble the Stark Law, but address self-referral of patients for whom the federal government is not the payer (7, 46).

2 The financial relationship typically involves physician ownership of the facility, but may instead involve relatively complex transactions through which the physician can profit by providing services to patients through the facility (69).

3 Physician financial relationships with entities to which they refer patients are also governed by the federal anti-kickback law, which makes it a crime to knowingly offer or receive remuneration intended to induce referrals under any program for which the federal government purchases services. (76).

4 ASCs have been considered to be an extension of physician offices, and it was thought (prior to the growth of physician-owned specialty hospitals) that individual physicians did not account for large enough shares of a hospital's revenue to have ownership affect their referral decisions.

# Introduction

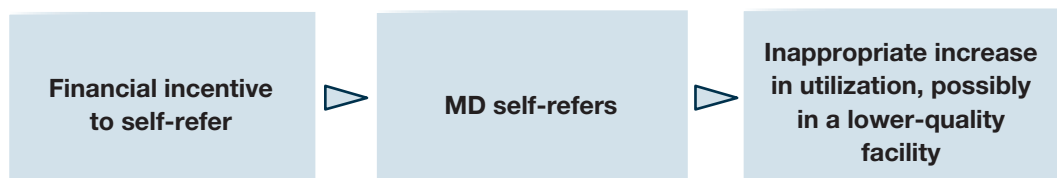
## The report will address the following questions:

1. What is the prevalence and growth of self-referral to physician-owned specialty facilities?
2. What are the factors leading to physician self-referral and to the creation of physician-owned specialty facilities?
3. What are the effects of physician self-referral and of physician-owned specialty facilities on quality, cost, access (particularly for ethnic minorities and the poor) and the organization of health care?

## Conceptual model

Many discussions of physician self-referral focus on the conflict of interest inherent in self-referral and implicitly use a simple model (Figure 1) that predicts that self-referral will increase the cost of care and possibly reduce its quality as well:

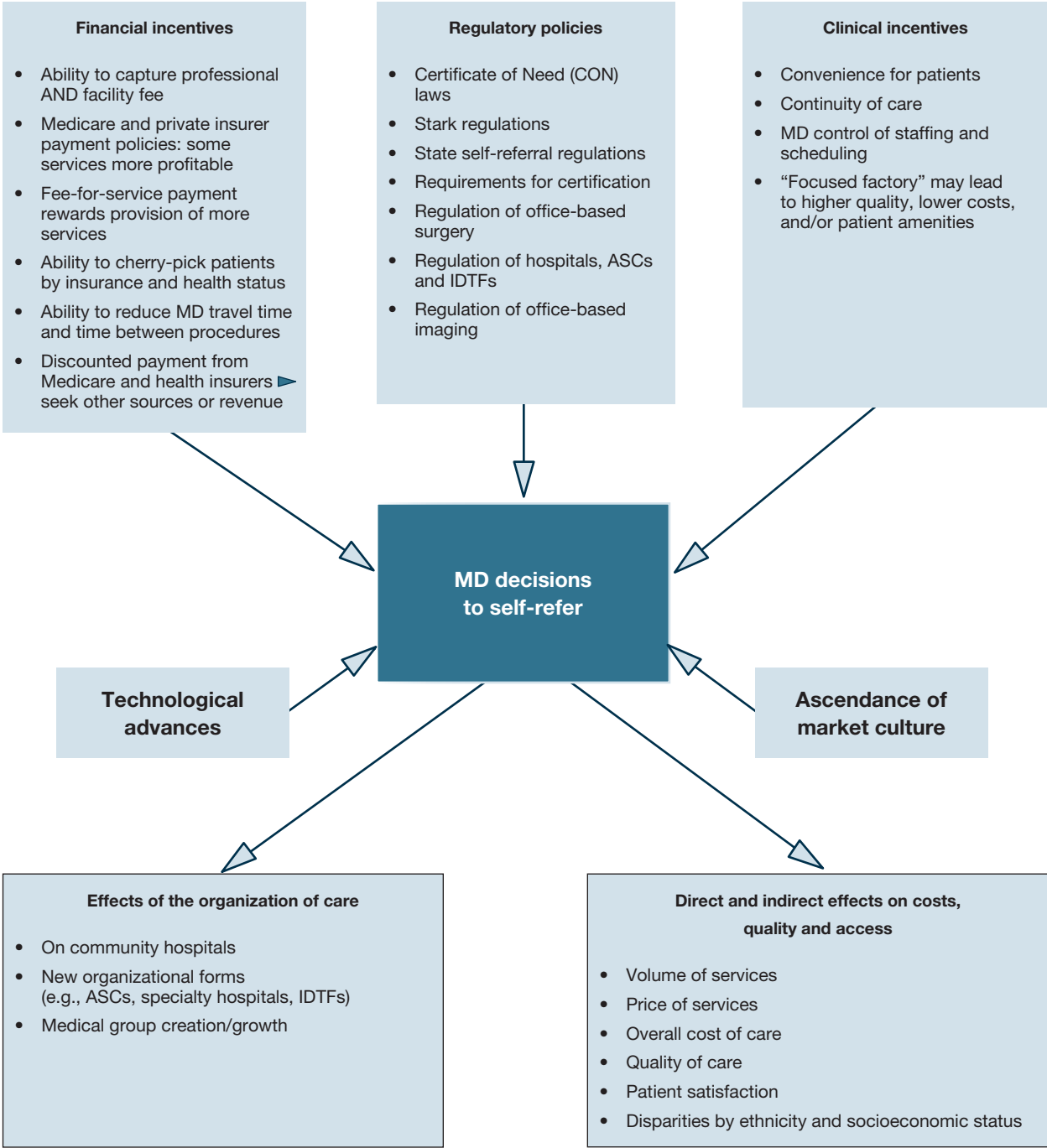
Figure 1.



However, this model fails to account for the multiple factors likely to affect physicians' decisions. It also omits the complex range of effects—both desirable and undesirable—that self-referral may have. Figure 2 presents a model that better reflects the complexity of the factors likely to affect physician decision-making and the range of effects that physician self-referral may have.

# Introduction

Figure 2. Causes and effects of physician self-referral and physician-owned facilities



## Introduction

Figure 2 helps emphasize several important points:

- Physician decisions to self-refer are likely to be affected not just by financial incentives, but by regulation and clinical incentives as well. Each of these drivers is a potential leverage point for changing the types and extent of self-referral.
- Physician self-referral has both direct and indirect effects.
  - Direct effects refer to the quality and costs of care provided by physician-owned facilities themselves, and the degree to which these facilities provide access to patients who may need care.
  - Indirect effects refer to effects that physician-owned facilities may have on other facilities (typically, hospitals not owned by physicians) located in the market in which the physician-owned facility exists. Indirect effects typically result from actions—such as marketing a cardiac service line or increasing scheduling efficiency for operating rooms—taken by general hospitals in response to the creation of physician-owned facilities such as specialty hospitals and ASCs (4).
- Physician self-referral may also affect quality, costs and access by leading to changes in the organization of health care. For example, some specialists are merging very small practices into larger, single specialty groups that have the capital to purchase a CT, MRI or even PET scanner, and the patient volume to keep the scanner busy (13).<sup>5</sup> Additionally, physician self-referral has led to the creation of new organizational forms: specialty hospitals, ASCs and IDTFs.

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<sup>5</sup> Larger single specialty groups may or may not provide higher-quality care—evidence is not available on this question—but may also have stronger negotiating leverage with health plans, thus potentially gaining higher payment rates and raising health care costs.

## Findings

### What is the prevalence and growth of self-referral to physician-owned facilities?<sup>6</sup>

#### Physician-owned specialty hospitals

**The number of specialty hospitals owned partly or wholly by physicians more than doubled between 2002 and 2007, and continued growth is expected (97) (Figure 3).**<sup>7</sup> Physician-owned specialty hospitals account for slightly more than one percent of all Medicare inpatient spending (95), but may have large market shares within their communities. Cardiac hospitals' median share of cardiac surgical discharges in their markets in 2004 was 26 percent, with some as high as 41 percent (62). The market share of orthopedic and surgical hospitals is generally much smaller (62). Precise figures are not available, but it appears that at least 70 percent of specialty hospitals, have at least some physician owners (99). The distinction between orthopedic and surgical hospitals is not very precise—it appears that most such physician-owned hospitals do both—so recent work combines the two when counting specialty hospitals.

Figure 3. Growth of physician-owned specialty hospitals

	2002	2004	2007
Total	46	89	109
Cardiac	12	25	20
Orthopedic/Surgical	34	64	89

Source: 2002 and 2004 data from MedPAC (62); 2007 data from OIG (80)<sup>8</sup>

The number of specialty hospitals, particularly surgical hospitals, is expected to increase. These hospitals are relatively inexpensive to create, receive higher per case payments than ASCs for the same types of cases, and are permitted by Medicare, to a greater extent than ASCs, to bill for imaging services in addition to the per case payment (see Appendix II for a summary of Medicare payment methods). Anecdotal reports suggest that some surgical hospitals have been created simply by adding to an existing ASC a small number of beds intended for overnight admissions.

Physician ownership interest varies widely among specialty hospitals (Figure 4). Because cardiac hospitals are much larger and costly to build,<sup>9</sup> physicians usually create them in joint ventures with local general hospitals or with national corporations such as MedCath. Joint ventures are sometimes used for orthopedic and surgical hospitals as well (97). The median percentage owned by physicians is 31 percent for cardiac hospitals, 50 percent for orthopedic hospitals and 70 percent for surgical hospitals (98). However, the ownership shares of individual physicians are generally small—less than 3 percent in half of hospitals (98). The higher the percentage of ownership that a physician has in a specialty hospital, the more likely that physician is to refer patients to the specialty hospital rather than a general hospital (15). Cardiac hospitals on average receive

6 Not all specialty hospitals and ASCs have physician owners; when this report refers to "specialty hospitals" or "ASCs," it is referring to those that do have physician owners, unless otherwise specified. For imaging services, the report refers, unless otherwise specified, to facilities owned at least in part by physicians or to facilities with which physicians have some other form of financial relationship.

7 Author's calculation, based on combining data from references (62) and (80).

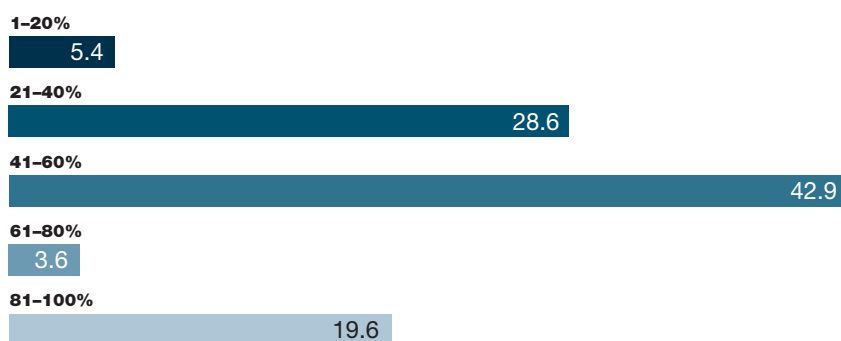
8 The exact number of specialty hospitals at present is not known; a CMS posting on its web site suggests there may be as many as 130 as of November 2006 ([http://www.cms.hhs.gov/PhysicianSelfReferral/06a\\_DRA\\_Reports.asp#TopOfPage](http://www.cms.hhs.gov/PhysicianSelfReferral/06a_DRA_Reports.asp#TopOfPage)). This table does not include specialty hospitals focused on obstetric care, which are relatively uncommon and not increasing in number.

9 The median cardiac hospital has 56 beds; the median orthopedic or surgical hospital has 14 beds (62).

## Findings

about half of their admissions and revenue from patients referred by physician owners, while 80 percent to 90 percent of admissions and revenues for orthopedic and surgical hospitals come from patients referred by physician owners (15, 16, 94).

Figure 4. Physician-owned specialty hospitals by extent of physician ownership



Source: GAO, 2003 (99)

### Diagnostic imaging

**In recent years, the volume of diagnostic imaging services—particularly advanced imaging (CT, MRI and PET scanning)—has been growing far more rapidly than other physician services.** Between 1999 and 2004, Medicare costs for imaging services more than doubled (63), and these costs have continued to increase rapidly since 2004 (58). Much of the increase in imaging involves physician self-referral, rather than referral to non-physician-owned facilities in which radiologists interpret the images. Between 1995 and 2005, the percentage of advanced imaging scans interpreted by radiologists fell from 83 percent to 58 percent (81). By 2005, radiologists were receiving only 40 percent of Medicare payments for all imaging services while the percentage paid to cardiologists, for example, had increased to 25 percent (60).

Physician self-referral for imaging takes two forms: imaging done within the physician’s medical group facilities and imaging done in Independent Diagnostic Testing Facilities (IDTFs).

Self-referral by physicians for imaging services within their own office or medical group practice is permitted by the Stark regulations. The number of radionuclide perfusion imaging scans of the heart performed in cardiologist offices more than doubled between 1998 and 2002 (50). For orthopedists, the number of advanced imaging procedures performed in 2005 was 33 times higher than in 1995; for cardiologists and family physicians the rates were 29 and 11 times higher, respectively (81).

The second form of self-referral for imaging is more complex: physicians are increasingly referring patients to Independent Diagnostic Testing Facilities (IDTFs) for imaging services. IDTFs are defined by Medicare as entities that are independent of a hospital or physician’s office in which licensed or certified nonphysician personnel (technicians) perform diagnostic tests (usually imaging studies) under physician supervision (82). Between 2000 and 2002, the number of IDTFs increased by more than one-third, from 1,784 to 2,403 (66); the current number may be as high as 5,800 or more (44). The IDTF share of advanced imaging services increased from 2.6 percent to 23 percent between 1995 and 2005 (81). Anecdotally, IDTFs may be owned by private investors, for-private companies, radiologists or other physicians (44), but there is no systematic data on IDTF ownership.



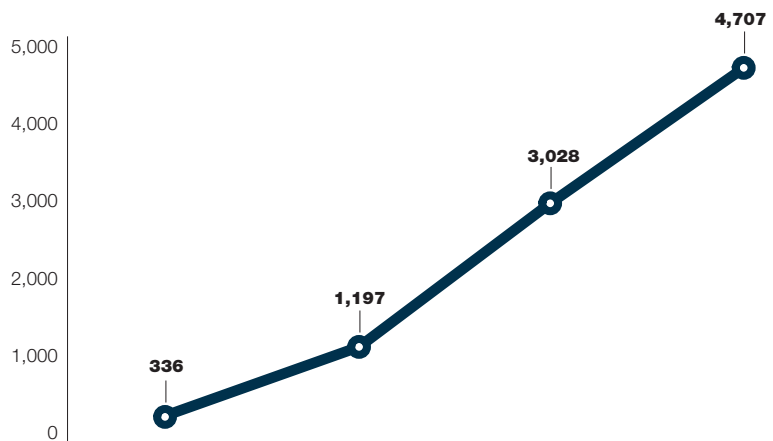
## Findings

The Stark regulations prohibit physicians from referring patients for imaging services to outside facilities with which they have a financial relationship, and the anti-kickback law prohibits physicians from receiving compensation that is related to the referrals they make. However, recent reports suggest that physicians are using lease, time-share, and pay-per-click arrangements with IDTFs to profit by referring patients to these facilities while trying to remain within the law (70). In these arrangements, physicians either lease all or part of an imaging center for specific blocks of time or pay the imaging center a set fee for each scan referred. The physician then submits a global bill that covers both the technical component (providing the image) and the professional component (interpreting the image) of the scan. The physician profits from the difference between the payment by Medicare or private health insurance plan for the global bill and the amount the physician pays to the IDTF (see Appendix II).

### Outpatient surgical and endoscopic procedures performed in ASCs and physician offices

**Surgery is increasingly being done in physician offices and in ASCs.** The volume of surgery performed in physician offices and in ASCs has been increasing rapidly, far outpacing the growth at hospital outpatient departments (67). Between 1999 and 2005, the volume of services performed in ASCs grew at seven times the rate of services performed at hospital outpatient departments (67). Eighty percent of ASCs are owned either by physicians alone or through a joint venture with a hospital or corporation (67). The number of ASCs opened in the last twenty years has skyrocketed (Figure 5).

Figure 5. Growth in ASCs, 1985 to 2006



Source: MedPAC (60) and CMS (16)

### What are the factors leading to physician self-referral and to the creation of physician-owned specialty facilities?

#### Financial incentives

- **The opportunity to be paid both a professional fee and a facility fee:** Medicare and private health plans pay for services through professional fees paid to physicians and facility fees paid to hospitals and ASCs in which services are provided (see Appendix II).<sup>10</sup> By providing services within facilities they own, physicians are paid for their own services (the professional fee), plus receive a share of any profit generated by the facility.
- **Fee-for-service payment and the opportunity to increase the volume of services provided (see Appendix II):** Since patients are not generally able to judge whether a particular service is necessary, self-referral makes it possible for physicians to increase the volume of services they provide. The fee-for-service payment system rewards physicians who provide a high volume of services. Specialty hospitals and ASCs are paid per admission and per case, respectively; this form of payment also encourages delivery of a high volume of services (though it does provide an incentive to control the cost of providing care once the patient is admitted).<sup>11</sup>
- **The ability to profit from services that use little of the physician's time.** Physicians' incentive to increase the volume of services they provide is limited by their time (and, presumably, by professional ethics, which proscribe the provision of unnecessary services) (58). However, it requires little extra time for a physician to receive a share of profits generated by facility fees paid to hospitals or ASCs, or from the technical fee component of imaging services. The volume of imaging procedures (which require little physician time) varies threefold across different areas of the United States, twice the rate of variation for major surgical procedures (68).
- **Cost containment policies:** As Medicare and private health plans constrain physician payment rates, physicians seek to maintain or increase their income; self-referral to their own facilities is an important source of such income (83). In 2006 alone, one-fifth of physicians reported their practice had expanded the imaging services they provide (61).
- **Efficiency:** Performing procedures in the office saves physicians time and limits schedule disruption from traveling to the hospital. Physicians can perform more procedures per hour in specialty hospitals and ASCs because they control scheduling and staffing, because these facilities focus on a narrow range of procedures, and disruptions of scheduling for emergency cases are rare (14).
- **Higher reimbursement for certain services:** Medicare and private health plans pay more (compared with the cost of providing the service) for certain types of services than for others (see Appendix II). Procedural and imaging services are paid at higher rates than cognitive services, and certain types of procedures and imaging services are paid at higher rates than others (9, 34). This makes self-referral for these services more profitable and is an important reason for physicians investing in specialty hospitals that focus on cardiac or orthopedic and surgical procedures rather than, for example, on caring for patients with more general, non-surgical diseases. Advanced imaging services (CT, MRI and PET scanning) are also paid at relatively high rates. Medicare facility payment rates for surgical and endoscopic procedures vary somewhat idiosyncratically across hospital outpatient departments, physician offices and ASCs, creating an incentive to perform procedures in the setting in which reimbursement is highest (59).

<sup>10</sup> The facility fee for services provided in physician offices is built into the physician's professional fee.

<sup>11</sup> For information on payment methods for physician, hospital, ASC and imaging services, see Appendix 1.

## Findings

- **Payment policies make some patients more profitable than others:** Private health plans usually pay more than Medicare, which in turns pays much more than Medicaid or the amount physicians can expect to collect from poor patients with no insurance. Additionally, two patients who receive the same service and have the same health insurance may nevertheless differ greatly in the profit they produce for providers. Medicare’s Diagnosis Related Group (DRG) system, for example, pays a fixed amount per cardiac bypass surgery. Patients likely to recover quickly from the surgery, without complications, are therefore more profitable. Self-referring physicians can refer patients to their own facilities whom they believe are likely to be most profitable, based on their type of insurance and their risk for complications. Patients likely to be unprofitable can be sent to community hospitals.
- **Elective procedures not covered by health insurance:** The demand for cosmetic surgery—most of which is performed in physician offices—has been increasing. Most cosmetic surgery is paid for by patients out-of-pocket, and is therefore profitable for physicians, since it is not subject to the discounting done by Medicare and private health plans.

### Regulatory policies

- **Anti-self-referral legislation:** The Stark regulations have eliminated certain forms of self-referral, but do not ban self-referral to specialty hospitals or ASCs, or for office-based surgical or imaging procedures.
- **Certificate of need (CON) laws:** In some states CON regulation has blocked the creation of specialty hospitals and ASCs. Ninety-six percent of specialty hospitals created since 1990, and all that are currently under development, are located in states without CON (97). Two-thirds of specialty hospitals (97) are located in just seven states and 40 percent of ASCs are located in just five states (67).
- **Certification and licensure:** Medicare and the states require that hospitals and ASCs be accredited by independent organizations such as the Joint Commission. However, for Medicare and most states, regulation of office-based imaging and surgery is very weak or nonexistent (27).

### Clinical incentives

- **Quality of care:** If specialty hospitals and ASCs can function as “focused factories” that specialize in a relatively narrow range of services, they may be able to provide care that equals or exceeds the quality provided at general hospitals.
- **Patient convenience and timeliness of care:** Specialty hospitals and ASCs generally provide amenities valued by patients such as easy parking and private rooms. Care provided within physician offices can be both convenient and timely. When patients require an imaging procedure (for example, for diagnosis of a possible fracture or pneumonia), it is convenient for the patient, and clinically expedient, to have the imaging done within the office of the treating physician. In-office imaging eliminates the need for patients to travel back and forth to other facilities and makes immediate diagnosis and treatment possible.

### Technology

Advances in surgical and imaging equipment and in anesthesia continually expand the possibilities—both technically and financially—for providing services in an outpatient setting that previously could be provided only within a hospital.

## Findings

### Emphasis on the “medical care market”

Since the advent of managed care a quarter of a century ago, many public and private policy-makers have strenuously and vocally worked to make medical care function as a market. Anecdotal evidence suggests that the emphasis on medical care as a market encourages physicians to feel justified to act as entrepreneurs whose goal is to use their time in sites and services likely to maximize their income, even when this means competing with their local community hospital (83).

### What are the effects of physician self-referral and of physician-owned specialty facilities on quality, cost, access (particularly for ethnic minorities and the poor) and the organization of health care?

It is important to note that the effects of self-referral may vary depending on the type of facility to which self-referral occurs. This report will discuss self-referral to specialty hospitals and ASCs, to physicians’ own offices for surgical, endoscopic and imaging procedures, and to IDTFs for imaging. The effects of self-referral and of physician-owned specialty facilities are difficult to study, so the available data is quite limited at this time (see Appendix III for methodological challenges). For a detailed summary of empirical studies of the effects of self-referral, see the appendix available at [www.policysynthesis.org](http://www.policysynthesis.org).

### Specialty hospitals

Figure 6. Summary of data on specialty hospital self-referral effects

Effect	Physician-owned specialty hospitals versus general hospitals
Access and patient selection	<ul style="list-style-type: none"><li>• Patients are healthier on average</li><li>• Few Medicaid patients, more higher-income patients and fewer minority patients</li></ul>
Quality	<ul style="list-style-type: none"><li>• Slightly lower risk-adjusted mortality rates</li><li>• Similar transfer rates (cardiac hospitals)</li><li>• Higher readmission rates</li><li>• Less likely to have an emergency department or a physician in the hospital around the clock (orthopedic and surgical hospitals)</li></ul>
Cost	<ul style="list-style-type: none"><li>• Shorter length of stay for cardiac hospitals, but cost per case appears similar for cardiac hospitals and higher for orthopedic/surgical hospitals</li><li>• Self-referral rates increase with ownership share</li><li>• Higher rates of cardiac and spinal surgery in markets with specialty hospitals</li></ul>
Organization of health care	<ul style="list-style-type: none"><li>• To date, no demonstrable effect on general hospitals’ profits or operations, but general hospitals do lose profitable admissions to specialty hospitals.</li></ul>

#### Access and patient selection

Specialty hospitals care for very few Medicaid patients—less than 4 percent of inpatient discharges for specialty hospitals are Medicaid patients—compared with 13 percent to 18 percent for competing general hospitals (15, 62, 94). They also provide very little charity care (94). Specialty hospital patients have higher incomes than general hospital patients (22, 43) and are less likely to be members of ethnic/racial minorities (22, 23).

## Findings

Access to care could be reduced if competition from specialty hospitals has an adverse effect on general hospitals' profit margins, leading them to cease providing unprofitable services (such as mental health services) or to close. Though general hospitals unquestionably lose some profitable admissions to specialty hospitals, their total profit margins have not, in aggregate, been affected by the entry of specialty hospitals (17, 62, 90).

It is not known to what extent, if any, the increased numbers of procedures provided in markets with specialty hospitals are medically indicated and to what extent they are questionable. If medically indicated, specialty hospitals fill a need by bringing services to a market that previously was under capacity. If questionable, specialty hospitals and/or the general hospitals with which they compete are engaging in "supplier-induced demand" that raises costs and may lower quality.

### *Quality*

Cardiac hospitals have generally been found to care for healthier patients and to have risk-adjusted mortality that is slightly, but statistically significant, lower than general hospitals (15, 22, 23, 78, 79). One study found equivalent mortality, except for sicker patients who had higher mortality in cardiac hospitals (43). Complication rates appear equal between cardiac and general hospitals (15, 22, 43). Transfer rates out of cardiac hospitals are the same as those for competing general hospitals (15).

There are fewer studies of orthopedic/surgical hospitals than cardiac hospitals, but the findings are similar. Orthopedic and surgical specialty hospitals care for healthier patients, have lower risk-adjusted mortality rates and have equal or lower complication rates compared with general hospitals (15, 21). Transfers from orthopedic/surgical hospitals are rare (15), but higher than general hospitals (22).

Both cardiac and orthopedic/surgical hospitals have somewhat higher readmission rates compared with general hospitals (15). Higher readmission rates could be due to inappropriately early discharge, though the lower mortality for cardiac hospital patients suggests that such discharges, if they occur, are unlikely to lead to patients' death.

The finding that specialty hospitals have lower risk-adjusted mortality rates should be viewed with caution, because risk-adjustment methodologies may underestimate the differences in health between patients admitted to specialty hospitals and those admitted to general hospitals (see Appendix III).

Nearly all cardiac hospitals have an emergency department (median, 7 beds) staffed around the clock (80). Only 48 percent of orthopedic/surgical hospitals have an emergency department (median, one bed), and only 15 percent have a physician in the hospital at all times. A recent study found many orthopedic/surgical hospitals have inadequate procedures in place to respond to emergencies; many rely on calling 911 if an emergency arises (80).

There are no systematic studies of patient experience at specialty hospitals, but one small study using focus groups found high satisfaction (15).

### *Costs*

There are four ways to analyze the effect on costs of physician self-referral to specialty hospitals or to other physician-owned facilities. First, cost may refer to the cost to the facility of providing services (e.g., the cost per patient admitted). This cost will be affected by the efficiency of the facility, the degree to which its capacity is used (a specialty hospital that admits few patients relative to its size will have high per admission costs, when fixed costs are taken into account), and the degree to which the hospital provides services during the admission (from the point of view of what is medically

## Findings

appropriate, too many or too few services may be provided). Second, cost may refer to the price that payers (e.g., Medicare and private health insurance plans) pay for a given service. If a provider facility has market power, the price paid may be considerably higher than the cost to the facility of providing a service. Third, cost may refer to the overall amount paid by payers for a given type of service in a given geographic area over some time period. This cost is equal to the price paid for the service multiplied by the volume of services provided. Fourth, cost may refer to the overall amount paid by payers for all services for a given population of patients in a given geographic area over some time period. If, for example, cardiac hospitals improve patients' health by providing an appropriate increase in the volume of cardiac procedures performed in a community, the cost to payers of cardiac services will increase, but the overall amount they pay for health care could decrease.

As “focused factories,” specialty hospitals should be able to operate at a lower cost than general hospitals. The single study that addressed this issue found that cardiac specialty hospitals have a per inpatient discharge cost similar to that of competing general hospitals (62). Because of low occupancy rates, costs per discharge are higher at orthopedic and surgical hospitals than for similar cases at general hospitals (62).

The finding that cardiac specialty hospitals' cost per discharge is not lower is particularly striking because two studies found that, for cardiac surgical procedures, risk adjusted length of stay is nearly a day shorter in specialty hospitals compared with general hospitals (40, 58).<sup>12</sup> There are three possible (and not mutually exclusive) explanations for a shorter length of stay in cardiac hospitals. First, it is possible that they are more efficient in providing care. Second, the research may not have been able to adequately risk adjust (i.e., specialty hospitals' patients may have been healthier than they predicted by the risk adjustment formulas). Third, patients may be discharged from specialty hospitals sooner than medically indicated. As noted above, one study did find higher readmission rates for both cardiac and orthopedic/surgical hospitals compared with general hospitals (15); readmission can be caused by premature discharge.

It is possible that per admission costs will be reduced, over time, if the increased competition generated by specialty hospitals results in both specialty and general hospitals finding innovative ways to provide care more efficiently. At present, there is no data demonstrating this effect.

Currently, no data are available on the price per service paid by payers. In theory, competition between specialty and general hospitals should make it possible for health plans to pay lower prices.

When cost is conceived as the cost to payers—that is, the price paid multiplied by the volume of a specific type of service provided—specialty hospitals appear to increase the volume of services provided in a market (in the categories of services they provide).<sup>13</sup> Cardiac surgery rates have consistently been found to increase in markets after the creation of a cardiac specialty hospital (62, 78, 91). The only relevant study of orthopedic surgery found that rates of spinal surgery are much higher in markets with an orthopedic specialty hospital (71). It is possible that the higher volume of procedures has two sources: first, the procedures done at the specialty hospital(s); second, “extra” procedures (procedures that would otherwise not have been performed) done at general hospitals trying to make up for procedures lost to the specialty hospital. At present, no data are available to address the cause for the higher utilization.

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<sup>12</sup> A third study found no difference in length of stay (22).

<sup>13</sup> There is no data on whether general hospitals increase their provision of services unrelated to those provided by specialty hospitals in response to losing admissions to specialty hospitals.

## Findings

Little data is available to evaluate the effects of specialty hospitals on overall health care costs in a market. One study that included only five cardiac hospitals, some of which may have been “hospitals within hospitals” (that is, operated by general hospitals, rather than physician-owned specialty hospitals) found that areas where a cardiac hospital opened had somewhat lower overall Medicare expenditures for hospital care (for all inpatient services) than areas without a cardiac hospital (2).

By increasing competition, specialty hospitals could make it possible for Medicare and private health plans to reduce the rates they pay to both specialty and general hospitals, but to date no study has addressed this issue.

### *Organization of health care*

Though general hospitals unquestionably lose some profitable admissions to specialty hospitals, their total profit margins—and therefore their ability to cross-subsidize unprofitable services and patients—were not affected by the entry of specialty hospitals, according to three studies that addressed this question (17, 62, 90). A survey-based study found no systematic evidence that general hospitals have changed their strategies or operations in response to competition from specialty hospitals (94), but more in-depth interviews with hospital executives suggest that changes are being made (14, 24). These changes include attempts to improve relations with specialty physicians and to improve operating room scheduling and efficiency, attempts to create joint venture specialty hospitals with physicians, and more intensive development and marketing of their own specialty services.

## Imaging

Figure 7. Summary of data on imaging self-referral effects

Effect	Self-referral for imaging: What do the data show?
Access and patient selection	<ul style="list-style-type: none"> <li>No data available.</li> </ul>
Quality	<ul style="list-style-type: none"> <li>Limited available data indicate that the quality of imaging services in IDTFs and physician offices varies greatly and is quite poor in some cases.</li> <li>Increased use of CT scanning is of concern because two percent of all cancers in the United States are estimated to be caused by CT scanning.</li> <li>Patients are significantly more likely to have imaging done on the same day as their office visit when seen by a self-referring physician.</li> </ul>
Costs	<ul style="list-style-type: none"> <li>Rates of diagnostic imaging, especially advanced imaging, are increasing rapidly; the rate of increase is much higher for physicians who self-refer for imaging services than for radiologists.</li> <li>Physicians who self-refer for imaging are much more likely to order imaging than physicians who do not self-refer.</li> <li>By 2005, radiologists were receiving only 40 percent of all Medicare payments for imaging services.</li> <li>Orthopedists and cardiologists are performing advanced imaging approximately 30 times more frequently and family physicians 11 times more frequently, than they did ten years ago.</li> </ul>
Organization of health care	<ul style="list-style-type: none"> <li>Some physicians—especially cardiologists, orthopedists and oncologists—are creating large single specialty groups in part to gain economies of scale for the purchase of advanced imaging equipment.</li> </ul>

## Findings

### *Access and patient selection*

No data are available.

### *Quality*

The quality of imaging services depends on the equipment used, the training and experience of the technicians who obtain the images and the physicians who interpret them (11). Surprisingly little data is available on the quality of imaging. Radiology offices are considered to be the gold standard. Anecdotally, cardiology and orthopedics practices that perform high volumes of a limited number of procedures (such as nuclear medicine stress tests or MRI scans of the extremities) provide high-quality imaging, but there is no data to demonstrate this. Physicians in other specialties that perform fewer imaging services (such as primary care) have been shown in a limited number of small studies to provide less accurate interpretations than radiologists (6, 31) and to be far more likely to use inferior equipment, inadequately trained staff and poor processes of care (77, 101).

Though the past decade has seen a phenomenal increase in the number of IDTFs, very little is known about them. A recent study by the Office of the Inspector General found that 43 percent of IDTFs were failing to meet CMS requirements (82). Deficiencies included providing unnecessary services (30 percent of services and 14 percent of IDTFs) and using technicians who did not have required licenses or certifications (13 percent of services).

To the extent that unnecessary imaging studies are performed, quality of care is compromised by leading to additional, unnecessary tests and by exposing patients to radiation. It is estimated that at current rates of CT scanning, two percent of the cancers in the United States will be attributable to CT scans (10), but this risk appears to be systematically underestimated by physicians and patients (48).

It is often stated that providing imaging services within physician offices increases quality because the service can be performed immediately, without the patient having to travel to and from another facility. When imaging services are performed within physician offices, ill or injured patients need not travel back and forth, and a diagnosis can be made and treatment begun immediately by the physician who is familiar with the patient and has the image in hand. Though no studies have addressed this issue, it is easy to understand the potential advantages of in-office imaging for patients with acute problems (e.g., to determine whether a patient with an injured ankle has a fracture or whether a patient with a cough and fever has pneumonia). One study did show that patients of physicians who self-refer are more likely to have imaging done on the same day as their office visit (33). However, these advantages of self-referral are diminished or absent altogether when physicians refer patients to outside facilities with which they have a lease or pay-per-click arrangement (65) or when the problem is not acute and the imaging procedure is scheduled for another day.

### *Costs*

Imaging, particularly advanced imaging (CT, MRI and PET scanning), has been the fastest growing physician service covered by Medicare in recent years. The most rapid increase has been in physician offices and IDTFs, that is, imaging that involves self-referral by non-radiologists (46-48, 51). Multiple studies have shown that physicians who self-refer are much more likely to order imaging studies (33, 42, 47, 52).



## Findings

The growth in imaging is not necessarily inappropriate. Nevertheless, three lines of evidence suggest that much of the increase is discretionary, at best. First, imaging rates vary threefold across different areas of the United States, twice the rate of variation seen with major surgical procedures, which are less discretionary (68). Second, the only study of IDTFs estimated that nearly one-third of imaging at these facilities was unnecessary (82). Third, when a large insurer made it more difficult for physicians to self-refer for imaging services, the number of imaging procedures declined by more than 20 percent (77).

In theory, if physicians in other specialties compete with radiologists to perform imaging services, the price paid for these services should decline. CMS has recently reduced the price it pays for imaging, especially for advanced imaging services. The very limited data available suggest that health plans have not negotiated lower imaging rates as a result of the increased competition (93).

### *Organization of health care*

Some physicians—especially cardiologists, orthopedists and oncologists—are creating large single specialty groups in part to gain economies of scale for the purchase of advanced imaging equipment (13).

### **Office-based surgery and ASCs**

Figure 8. Summary of data on ASC and office-based surgery effects

Effect	Comparison of effects among ASCs, office-based surgery and hospital outpatient surgery departments (OPDs)
Access and patient selection	<ul style="list-style-type: none"><li>• Patients treated in ASCs are somewhat healthier than those treated in OPDs.</li><li>• ASCs treat a lower percentage of Medicaid patients than OPDs.</li><li>• Patients' share of the cost of a procedure (coinsurance) is lower in ASCs than in OPDs for most procedures.</li></ul>
Quality	<ul style="list-style-type: none"><li>• Mortality and serious complication rates are similar and very low in ASCs and OPDs; limited data suggest that rates are higher for office-based surgery.</li><li>• Limited data suggest that mortality and serious complication rates from procedures involving sedation, general anesthesia or large amounts of local anesthetic are higher for office-based procedures, compared with ASCs and OPDs, particularly for children.</li></ul>
Costs	<ul style="list-style-type: none"><li>• Per case costs to the facility are lower for ASCs than for OPDs, and probably lower for physician offices than for ASCs.</li></ul>
Organization of health care	<ul style="list-style-type: none"><li>• ASCs adversely affect hospitals' outpatient survey volume, but there are no studies addressing the effect of ASCs on general hospital profit margins.</li></ul>

### *Access and patient selection*

ASCs treat a lower percentage of Medicaid patients than hospital outpatient surgery departments (OPDs) (32, 86). Patients having surgical or endoscopic procedures in ASCs are somewhat healthier than those treated in OPDs (19, 30, 67, 103, 104). The relative health of patients having surgical procedures in physician offices, compared to ASC and hospital OPDs, is not known.

Medicare beneficiaries' share of the payment for a procedure (coinsurance) is lower in ASCs than in OPDs for most procedures, though Medicare plans to reduce cost-sharing for OPDs over time (67).

## Findings

### *Quality*

Rates of death and serious complications in ASCs and hospital outpatient departments are similar and are very low (19, 29, 30, 69, 75, 104). There are insufficient data on rates of death and serious complications from office-based surgery, but the data that do exist suggest rates may be high for procedures that require sedation, general anesthesia or large amounts of local anesthetic (30, 36, 89, 100, 102). Hospital outpatient departments deal more effectively with pediatric sedation and general anesthetic problems than physician offices (1, 20).

It is important to note that states regulate hospitals and ASCs, and that Medicare requires them to meet certain standards to participate in the Medicare program; however, with the exception of a few states, there is little if any oversight of procedures done in physician offices. The lack of oversight is particularly worrisome because one-third of physicians practice in one- or two-physician offices where there is little or no oversight from other physicians (53).

### *Costs*

The per case cost to hospital outpatient departments is higher than it is for ASCs (67, 83). Physician offices, which have a minimal regulatory burden and generally lower paid staff, are likely to have the lowest per case costs, though data are not available. No data are available on the effect of ASCs or office-based surgery on market-wide costs of care. There is no data available on the reason why ASCs have lower per case costs than OPDs. The extent to which lower costs in ASCs are due to efficiency rather than having a lower regulatory burden, not having to maintain an emergency department, and in general having lower fixed costs than hospitals, is not known.

### *Organization of health care*

General hospitals report feeling increased competition from ASCs (14, 95), and ASCs do adversely affect hospitals' outpatient volume (8, 56), but there are no studies addressing the effect of ASCs on general hospital profit margins.

## **Conclusion**

The benefits and costs of physician self-referral may differ substantially, depending on the service in question. For example, some forms of physician self-referral—such as leasing and pay-per-click imaging arrangements—appear to have little potential for improving quality or controlling costs. These arrangements do not provide any potential benefits—such as immediate, in-office diagnosis and treatment, or physician involvement in operating high-quality, efficient “focused factories”—that might result from physician self-referral for in-office imaging or to an ASC or specialty hospital.

There is strong evidence that self-referral increases the utilization of health care services and indirect evidence suggests that at least some of this increase is not medically appropriate. Increased utilization will lead to increased health care costs, everything else being equal. However, the effects of self-referral and of physician-owned facilities on the price of services and on patients' overall health are not clear; it is not yet known whether competition from physician-owned facilities will lead to lower prices paid for services and/or to significantly better patient health.

## Findings

Specialty hospitals and ASCs treat patients more likely to be profitable—that is, they treat patients less likely to have complications, and fewer Medicaid patients—than general hospitals.

For the types of patients treated and the narrower range of services provided, the quality of care provided in specialty hospitals and ASCs appears to be comparable to that provided in general hospitals. Orthopedic/surgical hospitals and ASCs appear less capable of dealing with emergencies than general hospitals, however. Much less is known about the quality of imaging services in IDTFs and physician offices, and about the quality of surgical and endoscopic procedures in physician offices.

Overall, general hospitals have maintained their profit margins despite competition from physician-owned facilities. This could change over time if, as is anticipated, the number and market share of these facilities continues to grow.

## Implications for Policy-Makers

Physician self-referral and physician-owned facilities present difficult choices for policy-makers, for at least four reasons. First, their effects on the quality and cost of health care are likely to differ, depending on the type of self-referral and physician-owned facility, making one-size-fits-all policy-making undesirable. Second, as this synthesis indicates, the evidence on which to base policies is just beginning to accumulate and in many areas is not decisive. Third, the choice is not simply whether to permit physician self-referral or to prohibit it, but whether to permit it, prohibit it, or regulate it in ways that may improve its effects on quality and costs (for example, by strengthening the conditions that physicians must meet to be permitted to provide imaging services in their own offices). Fourth, policy-makers must consider the dynamics of self-referral and of physician-owned facilities—that is, consider not just their current effect, but their likely effects over time, and not just the quality and cost of the care that physician-owned facilities provide, but their likely effects over time on competing facilities, notably general hospitals.

Based on the evidence, policy-makers have a number of options, including making no changes to self-referral and physician-owned facilities until more evidence on the effects accrues. Alternatively, policy-makers could:

- Prohibit or more strictly prohibit certain forms of self-referral (as has already been done to some extent through the Stark regulations) and/or certain forms of physician-owned specialty facilities.<sup>14</sup>
- Require physicians to notify patients when they are suggesting a service involving self-referral and provide patients with information about alternate facilities from which they could obtain the service.<sup>15</sup>
- Adopt policies aimed at increasing the quality of services provided by facilities to which physicians self-refer. For example, Medicare, state regulators and health plans could strengthen their conditions of participation and oversight of ASCs, IDTFs (82, 84) and physician offices that want to provide imaging services or office-based surgery (27, 93). In addition, Medicare and states could strengthen the requirements for specialty hospitals' capabilities to deal with emergencies.
- Change payment methods so certain services, patients and sites of care are not more profitable than others. This would reduce physician (and hospital) incentives to focus on certain services and patients at the expense of others and would encourage the provision of care at the site (physician office, ASC, specialty hospital or general hospital) most appropriate for the patient, rather than the site with the highest payment rate. Policies that made likely profit margins more equal across different types of services and sites of care would encourage the creation of facilities only when they are able to provide high-quality, cost-efficient care (32, 38-40, 56, 65, 94). As noted in Appendix II, during the past few years, Medicare has explicitly moved in this direction, though Medicare alone cannot solve the problem.
- The effects of increased competition for general hospitals from specialty hospitals and ASCs should be monitored. Evidence to date indicates that, overall, general hospitals have been able to maintain their net revenues despite competition from specialty hospitals. However, there is no question that general hospitals lose large numbers of profitable cases to physician-owned specialty hospitals and ASCs, and to imaging facilities that physicians own or with which they

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<sup>14</sup> For example, Medicare has recently adopted regulations likely to curtail, if not eliminate, pay-per-click and leasing arrangements based on physician self-referral for imaging (37, 92).

<sup>15</sup> Sixteen states currently require physicians to disclose ownership interests in specialty hospitals to the patients they refer to the hospital (94).

## Implications for Policy-Makers

have a financial relationship. There is no evidence to indicate the extent to which general hospitals are maintaining their profit margins by becoming more efficient versus maintaining them by, for example, cutting back on their provision of unprofitable types of service and/or on the numbers of uninsured or poorly insured patients for whom they provide care. Over time, if competition from physician-owned facilities continues to increase, damage to the ability of general hospitals to cross-subsidize unprofitable services and patients could become evident. If this were to occur, policy-makers would have to decide whether to prohibit physician-owned facilities or to find ways to get adequate funds to general hospitals. The latter choice might be preferable if evidence accumulates that physician-owned facilities are providing high-quality, cost-efficient care, even if only to healthier patients.<sup>16</sup> Although from the general hospital point of view, physicians' ability to select more profitable patients to refer to their own facilities is unfair competition, such referrals may be efficient from a societal point of view, if these facilities can provide high-quality care for such patients at lower cost than general hospitals (24).

If health care were a well-functioning competitive market, the emergence of physician-owned facilities would be expected to increase innovation and the quality and efficiency of care provided both by these facilities and their competitors. To the extent that this is not true—for example, because Medicare sets prices and because providers can induce demand for more services from patients and can use market power to gain higher prices—the potential benefits of competition will not be realized (5).

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<sup>16</sup> Another possibility would be to place additional requirements on physician-owned facilities. For example, several states have recently begun to require specialty hospitals to provide a certain minimum percentage of their care to Medicaid patients or to contribute to a statewide fund to support hospitals that do care for large numbers of these patients (18). New Jersey requires ASCs to contribute to a statewide fund. Specialty hospitals argue, however, that they provide more community benefit than nonprofit general hospitals, because they pay taxes and do not receive the disproportionate share payments received by some general hospitals (15).

## The Need for Additional Information

Significant policy-relevant gaps remain in our knowledge about physician self-referral, physician-owned specialty facilities and their effects. It will be particularly important to understand more about both the direct effects of physician self-referral (i.e., the quality and cost of the care provided by physician-owned facilities) and the indirect effects (i.e., how physician-owned facilities affect overall quality and costs in markets in which they exist). It will also be important to understand these effects not just at a given moment, but as they evolve over time. It would be useful if research were funded and designed to address the following questions:

- How many physician-owned specialty facilities exist and what is the extent of physician ownership in these facilities?
- Is increased utilization due to physician self-referral clinically appropriate?
- What are the effects of physician-owned ASCs and specialty hospitals on the quality and cost of care in the markets in which they exist?
- What effects do physician-owned ASCs and specialty hospitals have on the quality and cost of care for commercially insured patients? Studies to date focus on Medicare patients, for whom data is more readily available.
- How does the percentage of individual physician or individual medical group ownership of an ASC or specialty hospital affect physicians' referral patterns and physicians' investment of time and money in ensuring that their facility provides high-quality care?
- What is the quality of imaging and surgical procedures in physician offices compared with ASCs and hospital OPDs? Ideally, imaging studies would look beyond the accuracy of imaging interpretation to investigate whether patients who receive imaging in a physician office do better, on average, than those whom physicians referred to an outside facility for imaging.
- IDTFs provide a large and increasing percentage of imaging services, but very little is known about them. Who owns them and what is the quality of the imaging they provide?

## Appendix I References

1. Arens JF. "Anesthesia for Office-Based Surgery: Are We Paying Too High a Price?" *Mayo Clinic Proceedings*, vol. 75, no. 3, 2000.
2. Barro JR, Huckman RS, Kessler DP. "The Effects of Cardiac Specialty Hospitals on the Cost and Quality of Medical Care." *Journal of Health Economics*, vol. 25, no. 4, 2006.
3. Berenson RA, Ginsburg PG, May JH. "Hospital-Physician Relations: Cooperation, Competition, or Separation?" *Health Affairs*, vol. 26, no. 1, 2006.
4. Berenson RA, Bodenheimer T, Pham HH. "Specialty-Service Lines: Salvos in the New Medical Arms Race." *Health Affairs*, vol. 25, no. 5, 2006.
5. Berenson RA, Bazzoli GJ, Au M. "Do Specialty Hospitals Promote Price Competition?" Center for Studying Health System Change. Issue Brief No. 103. Washington, D.C., January 2006.
6. Bergus G, Franken E, Koch T, et al. "Radiologic Interpretation by Family Physicians in an Office Practice Setting." *Journal of Family Practice*, vol. 41, no. 4, 1995.
7. Bethard R. "Physician Self-Referral: Beyond Stark II." *Brandeis Law Journal*, vol. 43, 2005.
8. Bian J, Morrissey MA. "Free-Standing Ambulatory Surgery Centers and Hospital Surgery Volume." *Inquiry*, vol. 44, no. 2, 2007.
9. Bodenheimer T, Berenson RA, Rudolph P. "The Primary Care-Specialty Income Gap: Why It Matters." *Annals of Internal Medicine*, vol. 247, no. 4, 2007.
10. Brenner DJ, Hall EJ. "Computed Tomography—An Increasing Source of Radiation Exposure." *New England Journal of Medicine*, vol. 357, no. 22, 2007.
11. Brown OW, Bendick PJ, Bove PG, et al. "Reliability of Extracranial Carotid Artery Duplex Ultrasound Scanning: Value of Vascular Laboratory Accreditation." *Journal of Vascular Surgery*, vol. 39, no. 2, 2004.
12. Casalino LP, November EA, Berenson RA, Pham HH. "Hospital-Physician Relations: Two Tracks and the Decline of the Voluntary Medical Staff Model." under review, 2008.
13. Casalino LP, Pham HH, Bazzoli GJ. "The Growth of Single Specialty Medical Groups." *Health Affairs*, vol. 23, no. 2, 2004.
14. Casalino LP, Devers KJ, Brewster LR. "Focused Factories? Physician-Owned Specialty Facilities." *Health Affairs*, vol. 22, no. 6, 2003.
15. Centers for Medicare & Medicaid Services. "Study of Physician-Owned Specialty Hospitals Required in Section 507(C)(2) of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003." Washington, D.C., 2005.
16. Centers for Medicare and Medicaid Services. "Data Compendium, 2007 edition." Washington, D.C., 2007.
17. Cholet D, Liu S, Gimm G. "Analysis of Niche Hospitals in Texas and the Financial Impact on General Hospitals." Mathematica Policy Research Institute. Report No. 6229. Washington, D.C., October 26, 2006.
18. Choudhry S, Choudhry NK, Brennan TA. "Specialty Versus Community Hospitals: What Role for the Law?" *Health Affairs*, Web Exclusive, 2005.
19. Chukmaitov A, Menachemi N, Brown LS, et al. "A Comparative Study of Quality Outcomes in Freestanding Ambulatory Surgery Centers and Hospital-Based Outpatient Departments: 1997–2004." *Health Services Research*, 2007.
20. Coté, CJ, Notterman DA, Karl HW, et al. "Adverse Sedation Events in Pediatrics: A Critical Incident Analysis of Contributing Factors." *Pediatrics*, vol. 105, no. 4, 2000.

## Appendix I References

21. Cram, Peter, Rosenthal GE. "Physician-Owned Specialty Hospitals and Coronary Revascularization Utilization: Too Much of a Good Thing?" *Journal of the American Medical Association*, vol. 297, no. 9, 2007.
22. Cram P, Vaughan-Sarrazin MS, Wolf B, et al. "A Comparison of Total Hip and Knee Replacement in Specialty and General Hospitals." *Journal of Bone and Joint Surgery*, vol. 89, no. 8, 2007.
23. Cram P, Rosenthal GE, Vaughan-Sarrazin MS. "Cardiac Revascularization in Specialty and General Hospitals." *New England Journal of Medicine*, vol. 352, no. 14, 2005.
24. Devers KJ, Brewster LR, Casalino L. "Changes in Hospital Competitive Strategy: A New Medical Arms Race?" *Health Services Research*, vol. 38, no. 1, Part II, 2003.
25. Dobson A. "A Comparative Study of Patient Severity, Quality of Care and Community Impact at MedCath Heart Hospitals (Executive Summary)." The Lewin Group. September 2002.
26. Federal Trade Commission, Department of Justice. "Improving Health Care: A Dose of Competition." Washington, D.C. July 2004.
27. Federation of State Medical Boards. "Office-Based Surgery Regulation Overview by State." Dallas, Texas, February 2008.
28. Federation of State Medical Boards. "Report of the Special Committee on Office-Based Surgery." Dallas, Texas, 2002.
29. Fleisher LA, Pasternak R, Lyles A. "A Novel Index of Elevated Risk of Inpatient Hospital Admission Immediately Following Outpatient Surgery." *Archives of Surgery*, vol. 142, no. 3, 2007.
30. Fleisher LA, Pasternak R, Herbert R, Anderson GF. "Inpatient Hospital Admission and Death after Outpatient Surgery in Elderly Patients." *Archives of Surgery*, vol. 139, no. 1, 2004.
31. Franken EA, Bergus GR, Koch TJ, et al. "Added Value of Radiologist Consultation to Family Practitioners in the Outpatient Setting." *Radiology*, vol. 197, no. 3, 1995.
32. Gabel JR, Fahlman C, Kang R, et al. "Where Do I Send Thee? Does Physician Ownership Affect Referral Patterns to Ambulatory Surgery Centers?" *Health Affairs*, vol. 27, no. 3, 2008.
33. Gazelle GS, Halpern EF, Ryan HS, Tramontano AC. "Utilization of Diagnostic Medical Imaging: Comparison of Radiologist Referral Versus Same-Specialty Referral." *Radiology*, vol. 245, no. 2, 2007.
34. Ginsburg PB, Berenson RA. "Revising Medicare's Physician Fee Schedule—Much Activity, Little Change." *New England Journal of Medicine*, vol. 356, no. 12, 2007.
35. Gosfield AG. "The Stark Truth About the Stark Law. Part I." *Family Practice Management*, vol. 10, no. 10, 2003.
36. Grazer FM, de Jong RH. "Fatal Outcomes from Liposuction: Census Survey of Cosmetic Surgeons." *Plastic and Reconstructive Surgery*, vol. 105, no. 1, 2000.
37. Greeson TW, Zimmerman HM. "CMS 2008 Rulemaking Focuses on Curbing Self-Referred Imaging." *American Journal of Roentgenology*, vol. 90, no. 2, 2008.
38. Guterman S. "Specialty Hospitals: A Problem or a Symptom?" *Health Affairs*, vol. 25, no. 1, 2006.
39. Hadley J, Zuckerman S. "Physician-Owned Specialty Hospitals: A Market Signal for Medicare Payment Revisions." *Health Affairs*, Web Exclusive, 2005.
40. Healy D, Cromwell J, Thomas FG. "Repricing Specialty Hospital Outpatient Services Using Ambulatory Surgery Center Prices." *Health Care Financing Review*, vol. 29, no. 2, 2007.
41. Hillman BJ. "Trying to Regulate Imaging Self-Referral Is Like Playing Whack-a-Mole." *American Journal of Roentgenology*, vol. 189, no. 2, 2007.



## Appendix I References

42. Hillman BJ, Olson GT, Sunshine JH, et al. "Physicians' Utilization and Charges for Outpatient Diagnostic Imaging in a Medicare Population." *Journal of the American Medical Association*, vol. 268, no. 15, 1992.
43. Hwang CW, Anderson GF, Diener-West M, Powe NR. "Comorbidity and Outcomes of Coronary Bypass Graft Surgery at Cardiac Hospitals Versus General Hospitals." *Medical Care*, vol. 45, no. 8, 2007.
44. Iglehart JK. "The New Era of Medical Imaging: Promises and Pitfalls." *New England Journal of Medicine*, vol. 354, no. 26, 2006.
45. Iglehart JK. "The Uncertain Future of Specialty Hospitals." *New England Journal of Medicine*, vol. 352, no. 14, 2005.
46. Kolber MJ. "Stark Regulation: A Historical and Current Review of the Self-Referral Laws." *HEC Forum*, vol. 18, no. 1, 2006.
47. Kouri BE, Parsons RG, Alpert HR. "Physician Self-Referral for Diagnostic Imaging: Review of the Empiric Literature." *American Journal of Roentgenology*, vol. 179, no. 4, 2002.
48. Lee CI, Haims AH, Monico EP, et al. "Diagnostic CT Scans: Assessment of Patient, Physician, and Radiologist Awareness of Radiation Dose and Possible Risks." *Radiology*, vol. 231, no. 2, 2004.
49. Levin D, Rao V, Parker L, et al. "Ownership or Leasing of MRI Facilities by Nonradiologist Physicians Is a Rapidly Growing Trend." *Journal of the American College of Radiology*, vol. 5, no. 2, 2008.
50. Levin DC, Intenzo CM, Rao VM, et al. "Comparison of Recent Utilization Trends in Radionuclide Myocardial Perfusion Imaging among Radiologists and Cardiologists." *Journal of the American College of Radiology*, vol. 2, no. 10, 2005.
51. Levin DC, Rao VM, Maitino AJ, et al. "Comparative Increases in Utilization Rates of Ultrasound Examinations among Radiologists, Cardiologists, and Other Physicians from 1993 to 2001." *Journal of the American College of Radiology*, vol. 1, no. 8, 2004.
52. Levin DC, Edmiston RB, Ricci JA, et al. "Self-Referral in Private Offices for Imaging Studies Performed in Pennsylvania Blue Shield Subscribers During 1991." *Radiology*, vol. 189, no. 2, 1993.
53. Liebhaber A, Grossman JM. "Physicians Moving to Mid-Sized, Single Specialty Practices." Center for Studying Health System Change. Washington, D.C., August 2007.
54. Lubell J. "ASCs: We Can't Drive 65." *Modern Healthcare*, vol. 37, no. 29, 2007.
55. Lucas FL, DeLorenzo MA, Siewers AE, Wennberg DE. "Temporal Trends in the Utilization of Diagnostic Testing and Treatments for Cardiovascular Disease in the United States, 1993–2001." *Circulation*, vol. 113, no. 3, 2006.
56. Lynk WJ, Longley CS. "The Effect of Physician-Owned Surgicenters on Hospital Outpatient Surgery." *Health Affairs*, vol. 21, no. 4, 2002.
57. Maxwell S, Zuckerman S, Berenson RA. "Use of Physicians' Services under Medicare's Resource-Based Payments." *New England Journal of Medicine*, vol. 356, no. 18, 2007.
58. Medicare Payment Advisory Commission. "Report to the Congress: Medicare Payment Policy." Washington, D.C., March 2008.
59. Medicare Payment Advisory Commission. "Ambulatory Surgical Centers Payment System." Washington, D.C., 2007.
60. Medicare Payment Advisory Commission. "Healthcare Spending and the Medicare Program: A Data Book." Washington, D.C., June 2007.
61. Medicare Payment Advisory Commission. "Report to the Congress: Medicare Payment Policy." Washington, D.C., March 2007.

## Appendix I References

62. Medicare Payment Advisory Commission. "Physician-Owned Specialty Hospitals Revisited." Washington, D.C., August 2006.
63. Medicare Payment Advisory Commission. "Healthcare Spending and the Medicare Program: A Data Book." Washington, D.C., June 2006.
64. Medicare Payment Advisory Commission. "Report to the Congress: Physician-Owned Specialty Hospitals." Washington, D.C., March 2005.
65. Medicare Payment Advisory Commission. "Report to the Congress: Medicare Physician Payment Policy." Washington, D.C., March 2005.
66. Medicare Payment Advisory Commission. "Data Book June 2004." Washington, D.C., June 2004.
67. Medicare Payment Advisory Commission. "Report to the Congress: Medicare Payment Policy." Washington, D.C., March 2004.
68. Medicare Payment Advisory Commission. "Report to the Congress: Variation and Innovation in Medicare." Washington, D.C., 2003.
69. Mezei G, Chung F. "Return Hospital Visits and Hospital Readmissions after Ambulatory Surgery." *Annals of Surgery*, vol. 230, no. 5, 1999.
70. Mitchell JM. "The Prevalence of Physician Self-Referral Arrangements after Stark II: Evidence from Advanced Diagnostic Imaging." *Health Affairs*, vol. 26, no. 3, 2007.
71. Mitchell JM. "Utilization Changes Following Market Entry by Physician-Owned Specialty Hospitals." *Medical Care Research and Review*, vol. 64, no. 4, 2007.
72. Mitchell JM. "Effects of Physician-Owned Limited-Service Hospitals: Evidence from Arizona." *Health Affairs*, Web Exclusive, October 2005.
73. Mitchell JM. Physician Joint Ventures and Self-Referral: An Empirical Perspective. In: Spece, RG, Shimm DS, Buchanan AE, eds. *Conflicts of Interest in Clinical Practice and Research*. New York: Oxford University Press; 1996: 300-317.
74. Mitchell JM, Sass TR. "Physician Ownership of Ancillary Services: Indirect Demand Inducement or Quality Assurance?" *Journal of Health Economics*, vol. 14, no. 3, 1995.
75. Morello DC, Colon GA, Fredricks S. "Patient Safety in Accredited Office Surgical Facilities." *Plastic and Reconstructive Surgery*, vol. 99, no. 6, 1997.
76. Morrison AW. "An Analysis of Anti-Kickback and Self-Referral Law in Modern Health Care." *Journal of Legal Medicine*, vol. 21, no. 3, 2000.
77. Moskowitz H, Sunshine J, Grossman D, et al. "The Effect of Imaging Guidelines on the Number and Quality of Outpatient Radiographic Examinations." *American Journal of Roentgenology*, vol. 175, no. 1, 2000.
78. Nallamotheu BK, Rogers MA, Chernew ME, et al. "Opening of Specialty Cardiac Hospitals and Use of Coronary Revascularization in Medicare Beneficiaries." *Journal of the American Medical Association*, vol. 297, no. 9, 2007.
79. Nallamotheu BK, Wang Y, Cram P, et al. "Acute Myocardial Infarction and Congestive Heart Failure Outcomes at Specialty Cardiac Hospitals." *Circulation*, vol. 116, no. 19, 2007.
80. Office of Inspector General. "Physician-Owned Specialty Hospitals' Ability to Manage Medical Emergencies." Department of Health and Human Services. OEI-02-06-00310. Washington, D.C., January 2008.
81. Office of Inspector General. "Growth in Advanced Imaging Paid under the Medicare Physician Fee Schedule." OEI-01-06-00260. Washington, D.C., October 2007.

## Appendix I References

82. Office of Inspector General. "Review of Claims Billed by Independent Diagnostic Testing Facilities for Services Provided to Medicare Beneficiaries During Calendar Year 2001." U.S. Department of Health and Human Services. A-03-03-00002. Washington, D.C., June 2006.
83. Office of Inspector General. "Payment for Procedures in Outpatient Departments and Ambulatory Surgical Centers." U. S. Department of Health and Human Services. OEI-05-00-00340. Washington, D.C., January 2003.
84. Office of Inspector General. "Quality Oversight of Ambulatory Surgical Centers: A System in Neglect." U.S. Department of Health and Human Services. OEI-01-00-00450. Washington, D.C., February 2002.
85. Office of Inspector General. "Financial Arrangements between Physicians and Health Care Businesses." U.S. Department of Health and Human Services. OAI-12-88-01410. May 1989.
86. O'Sullivan J. "Medicare: Physician Self-Referral (Stark I and II)." CMS Report for Congress. Congressional Research Service. July 27, 2004.
87. Pennsylvania Health Care Cost Containment Council. An Annual Report on the Financial Health of Pennsylvania's Non-GAS Facilities: Financial Analysis 2006, Volume 2; November 2007.
88. Pham HH, Devers KJ, May JH, Berenson R. "Financial Pressures Spur Physician Entrepreneurialism." *Health Affairs*, vol. 23, no. 2, 2004.
89. Rao RB, Ely SF, Hoffman RS. "Deaths Related to Liposuction." *New England Journal of Medicine*, vol. 340, no. 19, 1999.
90. Schneider JE, Ohsfeldt RL, Morrisey MA, et al. "Effects of Specialty Hospitals on the Financial Performance of General Hospitals, 1997–2004." *Inquiry*, vol. 44, no. 3, 2007.
91. Stensland J, Winter A. "Do Physician-Owned Cardiac Hospitals Increase Utilization?" *Health Affairs*, vol. 25, no. 1, 2006.
92. Travis NL, Wool HS, Chananie SJ. "Centers for Medicare and Medicaid Now Scrutinizing Leasing Arrangements." *Journal of the American College of Radiology*, vol. 4, no. 10, 2007.
93. Tynan A, Berenson RA, Christianson JB. "Health Plans Target Advanced Imaging Services: Cost, Quality and Safety Concerns Prompt Renewed Oversight." Center Studying Health System Change. Issue Brief No. 118. Washington, D.C., February 2008.
94. United States Department of Health and Human Services. "Final Report to the Congress and Strategic and Implementing Plan Required under Section 5006 of the Deficit Reduction Act of 2005." 2006.
95. United States Government Accountability Office. "General Hospitals: Operational and Clinical Changes Largely Unaffected by Presence of Competing Specialty Hospitals." United States Government Accountability Office. GAO-06-520. Washington, D.C.: April 2006.
96. United States Government Accountability Office. "Payment for Ambulatory Surgical Centers Should Be Based on the Hospital Outpatient System." United States Government Accountability Office. GAO-07-86. Washington, D.C., November 2006.
97. United States Government Accountability Office. "Specialty Hospitals: Information on Potential New Facilities." GAO-05-647R. Washington, D.C., May 19, 2005.
98. United States General Accounting Office. "Specialty Hospitals: Geographic Location, Services Provided, and Financial Performance." GAO-04-167. Washington, D.C., October 2003.
99. United States General Accounting Office. "Specialty Hospitals: Information on National Market Share, Physician Ownership, and Patients Served." GAO-030683R. Washington, D.C., April 18, 2003.

## Appendix I References

100. Venkat AP, Coldiron B, Balkrishnan R, et al. "Lower Adverse Event and Mortality Rates in Physician Offices Compared with Ambulatory Surgery Centers: A Reappraisal of Florida Adverse Event Data." *Dermatologic Surgery*, vol. 30, no. 12, 2004.
101. Verilli DK, Bloch SM, Rousseau J, et al. "Design of a Privileging Program for Diagnostic Imaging: Costs and Implications for a Large Insurer in Massachusetts." *Radiology*, vol. 2208, no. 2, 1998.
102. Vila H, Jr., Soto R, Cantor AB, Mackey D. "Comparative Outcomes Analysis of Procedures Performed in Physician Offices and Ambulatory Surgery Centers." *Archives of Surgery*, vol. 138, no. 9, 2003.
103. Winter A. "Do Ambulatory Surgical Centers Treat Patients Who Are More Medically Complex Than Hospital Outpatient Departments?" *Health Affairs*, Web Exclusive, 2003.
104. Wynn BO, Sloss EM, Fung C, et al. "Services Provided in Multiple Ambulatory Settings: A Comparison of Selected Procedures." *RAND Health*, Report No. 04-3. July 2004.

This Appendix provides a very brief summary of the payment methods used by Medicare, emphasizing aspects particularly relevant to specialty hospitals, ASCs and imaging services. Generally speaking, private health insurance plans use methods similar to those used by Medicare, though they pay at higher rates. For further detail on payment methods, see the references noted in this Appendix. Payment fundamentals are clearly described in the October 2007 Payment Basics reports provided by MedPAC, available at [http://www.medpac.gov/payment\\_basics.cfm](http://www.medpac.gov/payment_basics.cfm). This Appendix makes liberal use of these reports.

### Payment for physician services

Medicare pays for physician services (e.g., an office visit, surgical procedure or imaging procedure) using the Resource-Based Relative Value Scale (RBRVS). The scale is created by taking into account the amount of physician work required to provide a service, expenses related to maintaining a practice and liability insurance costs. The values given to these three types of resources are adjusted by variations in the input prices in different markets and the total is multiplied by a standard dollar amount, called the fee schedule's conversion factor, to arrive at the payment amount. The amount of physician work for any given service is supposed to reflect the relative level of time, effort, skill and stress associated with providing the service.

Medicare's system of payment for physicians is, therefore, a fee-for-service system. In addition, the system makes it relatively more profitable to provide certain services than others.<sup>17</sup> Generally speaking, procedural services (such as surgical or imaging procedures) are more profitable than services that involve only thinking and talking to patients (these services are called "cognitive services" or "evaluation and management services"). To some extent, making certain services more profitable per unit of time is intended by Medicare. It is expected, for example, that an hour spent performing a neurosurgical procedure will provide more net income to a physician than an hour spent conducting routine office visits with patients. However, critics of the system argue that the payment differences are greater than is warranted by the relative amounts of time, effort, skill and stress associated with different services provided by physicians (9, 34). This is a particular concern when physicians provide services in which the practice expense component is particularly profitable or the work is overestimated. Since the practice expense payment does not consume physician time, physicians can generate profits from referral of patients to their own facilities without the natural limit imposed by the number of services a physician can personally perform in a day. Critics argue that the increase in self-referral for imaging services, in particular, results at least in part from this dynamic. Medicare has recently moved to reduce payments for the technical/practice expense component of imaging services (44). It is worth noting that some specialties (e.g., cardiologists and orthopedic surgeons) are better positioned to provide and profit from high-end imaging services than other specialties (e.g., primary care physicians).

When physicians provide a service in a hospital or an ASC, they are paid via the RBRVS for their service. However, Medicare also pays the hospital or ASC a fee which, for purposes of this report, will be called the "facility fee." (Note that for imaging and surgical services provided in a physician's office, the facility fee is embedded in the practice expense component of the fee paid to the physician through the RBRVS system.) Physician owners of a specialty hospital or ASC share in the net revenue of the facility if the fees paid to the facility exceed the facilities' costs. Certain services—notably cardiac procedures and some surgical procedures—generate more net revenue per case than other services. This provides a financial incentive for physicians to own cardiac and surgical hospitals and ASCs.

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<sup>17</sup> "More profitable" means that a physician's net income per unit of time that he or she spends on the procedure is higher.

### Payment for hospital services:

Medicare pays for inpatient hospital services through the inpatient prospective payment system, which is based on Diagnosis Related Groups (DRGs). DRG payment rates are intended to cover the costs that reasonably efficient providers would incur in furnishing high-quality care, thereby rewarding providers whose costs fall below the payment rates and penalizing those with costs above the payment rates. DRGs categorize patients into 743 DRGs, with each DRG intended to group together patients with similar clinical problems who are expected to require similar amounts of hospital resources. Each DRG has a relative weight that reflects the expected relative costliness of inpatient treatment for patients in that group. The payment rates for DRGs in each local market are determined by adjusting the base payment rates to reflect the input-price level in the local market and then multiplying by the relative weight for each DRG. The payment rate is increased for facilities that operate an approved resident training program or treat a disproportionate share of low-income patients. Rates are reduced for certain transfer cases and outlier payments are added for cases when the cost exceeds the outlier threshold. Medicare assigns each admitted patient to a DRG based on the discharge diagnoses and on whether certain surgical procedures were performed during the patient's hospital stay. Medicare is trying to address the problem that some patients within a DRG category may be healthier than others by moving rapidly toward a system of severity-adjusted DRGs known as Medicare severity (MS) DRGs. The new system has 335 base DRGs, most of which are split into two or three MS-DRGs.

### Payment to ASCs, hospital outpatient departments and physician offices

Under the new payment system, which will be phased in over a four-year period which began January 1, 2008, ASCs will be paid using the Ambulatory Payment Classification system, but at rates that on average will be 65 percent of the rate paid to hospital outpatient departments (OPDs) (54).<sup>18 19</sup>

Prior to this rule change, the Centers for Medicare & Medicaid Services (CMS) used two different systems to pay ASCs and OPDs, even though very similar sets of procedures are performed in these facilities. Both were paid on a prospective, per case basis, but relative payment rates across the two settings varied by the type of case. Whereas the hospital outpatient prospective payment system had hundreds of procedure groups (called Ambulatory Payment Classification groups, based on cost and clinical similarity, like the DRGs used to pay for inpatient care), whose relative value was updated annually, the ASC payment system had only nine procedure groups and had not been comprehensively updated in many years (96). Though the per-case cost overall is substantially lower for ASCs, OPDs were paid more for two-thirds of cases and ASCs were paid more for one-third (83).<sup>20</sup>

In some cases, the same procedure that is commonly performed in ASCs and OPDs is also performed in physician offices, with the facility fee paid varying by the setting. For example, the 2004 ASC facility payment for an upper gastrointestinal endoscopy with biopsy was \$446,

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18 The lower payment rate for ASCs was not determined on the basis of a calculation of ASC versus OPD costs, but rather was calculated so that it will maintain budget neutrality—i.e., the total amount expected to be paid for ASCs under the new payment system is about equal to what was expected to be paid if the payment system had not been changed.

19 The new payment system will result in higher rates for procedures commonly performed by some physician specialties and lower rates for procedures commonly performed by others (54).

20 Relative payment rates have changed somewhat since the GAO study, because the rates paid to ASCs have been frozen by order of Congress until 2009.

compared to the OPD payment of \$427 and the physician office rate of \$208 (67). The physician office rate, it should be noted, is the practice expense portion of the professional fee calculated through the physician payment system (RBRVS).<sup>21</sup>

The rule in effect in 2008 also expanded the number of procedures that may be performed in ASCs. Previously, CMS would not pay ASCs for procedures that were frequently performed in physician offices, exceed 90 minutes of operating room time or four hours of recovery room time, or pose a safety risk. Now, CMS will pay for all procedures not deemed to pose a significant safety risk when performed in an ASC and that do not require an overnight stay. This will significantly expand the number of procedures that can be performed in ASCs. However, to minimize financial incentives to shift procedures from physician offices to ASCs, for services that are performed in physician offices at least 50 percent of the time, payment to ASCs will be the lower of the rate based on the ASC payment system or the practice expense portion of the physician fee that applies when the procedure is performed in a physician office.

There are anecdotal reports, but no quantitative data, suggesting that one reason for physicians to create a physician-owned specialty hospital rather than an ASC has been to gain the often higher payment rates to OPDs, as well as payments for ancillary services made to OPDs but not to ASCs. Previously, Medicare paid OPDs, but not ASCs, a fee in addition to the per case fee, for such things as imaging studies related to the case; the new payment system narrows the differences in payment for ancillary services. This may be particularly true for orthopedic and surgical hospitals, some of which appear to be little more than an ASC with a few inpatient beds attached. Indeed, some orthopedic/surgical specialty hospitals were created on the foundation of a previously existing ASC.

### Payment for imaging services

Medicare divides imaging services into two components: the technical component, which is taking an image of the patient, and the professional component, which is a doctor's interpretation of the image. Medicare may pay for the components separately if each is performed by a different provider or may make a global payment to one provider as payment for both components. Medicare pays for imaging services in physician offices and IDTFs through the physician fee schedule, with the technical component paid through the practice expense portion of the physician fee. For hospital OPDs and ASCs (in cases where the imaging services are not bundled into the case rate for the surgical procedure being performed), Medicare pays a professional fee to the physician interpreting the image and a technical fee to the facility.

Until recently, the facility fee paid for imaging services provided in physician offices and IDTFs was sometimes considerably higher than the fee paid if the service was provided in an OPD; Congress has recently stipulated that these payment rates may no longer exceed those made to OPDs (44).

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<sup>21</sup> The portion of the RBRVS fee based on the required physician time and skill level is the same regardless of the setting in which a procedure is performed.

Unfortunately, the data available to study physician self-referral are quite limited, particularly regarding physician offices. Most studies have focused on specialty hospitals and ASCs, but many factors make it difficult to perform methodologically sound studies of physician self-referral.

The five biggest challenges to measuring the effects of self-referral, even when data are available, are risk selection, determining whether the services provided were needed, determining physician referral patterns, determining causality, and determining the indirect effects of self-referral (how self-referral effects the behavior of other providers, particularly general hospitals, in the community).

If physicians refer patients less likely to have complications to their own facilities, while referring sicker patients to general hospitals, the physician-owned facilities will appear to provide higher-quality, lower-cost care. Cardiac, orthopedic and surgical patients cared for by specialty hospitals are significantly healthier than those admitted with the same principal diagnoses to general hospitals (15, 22–3, 43, 72, 78, 79, 98).<sup>22</sup> Studies attempt to compensate for this by “risk adjusting” for patient factors likely to be associated with complications, but risk adjustment will be inadequate to the extent these factors are incomplete compared with physicians’ more detailed, firsthand knowledge of patients.

Physician self-referral for a given procedure nearly always leads to an overall increase in the number of procedures provided in a market. It is possible to track this growth, at least for Medicare patients, but it is difficult to determine the extent to which the increase is appropriate—that is, the extent to which physician-owned facilities are providing procedures for patients who need them but would not have received them if they had not been provided by the physician-owned facility.

It is very difficult to determine whether physician owners have different referral patterns than non-owners, because in most cases it is not possible to identify the physician owners of an ASC or specialty hospital.

It is difficult to demonstrate that physician-owned facilities cause specific effects in a market in which they are created. For example, if more cardiac bypass surgeries are performed in a market after entry by a specialty hospital, this could be because the market did not previously have sufficient cardiac surgery facilities or it could be due to competition between the specialty hospital and general hospitals leading to bypass surgeries being performed even when the indications for surgery are not strong.

The indirect effects of physician self-referral are difficult to measure because the behavior of other organizations in a community, such as general hospitals, are influenced by many factors in addition to self-referral to physician-owned facilities (2).

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<sup>22</sup> A study of 8 MedCath hospitals done by the Lewin Group found that these hospitals admitted patients with greater illness severity than competing general hospitals (25). This finding is hard to reconcile with six studies that found lower severity, but there is evidence that some cardiac hospitals do care for patients with illness severity equal to or greater than general hospitals.



### Identifying physician self-referral

One problem for researchers attempting to study physician self-referral is to determine when it is occurring. For specialty hospitals, for example, researchers must use a variety of techniques to generate a list of such hospitals, because no national census exists. The methods used differ slightly, but typically involve using Medicare hospital discharge data to identify hospitals with a high proportion of cardiac or orthopedic/surgical discharges. Once a list of specialty hospitals is generated, researchers interested in physician self-referral must determine, for each hospital, whether it has at least partial physician ownership. This must usually be done by directly contacting the hospitals. If researchers want to study the self-referral patterns of individual physician owners, they confront the obstacle that this information is not publicly available. They may attempt to obtain it directly from the hospitals or create algorithms, based on the proportion of admissions that a physician makes to specialty hospitals compared with general hospitals, to categorize physicians as owners. In some markets, many non-owner physicians have been found to admit to specialty hospitals so this technique is approximate as best. Although most specialty hospitals do have significant degree of physician ownership, it is important to be aware that some studies of specialty hospitals include both physician-owned and non-physician-owned specialty hospitals and therefore are not precisely studies of physician self-referral.

Similar problems confront researchers who want to study physician-owned ASCs or IDTFs with which a physician has a financial relationship. For imaging, self-referral is, appropriately, assumed to occur when physicians who are not radiologists submit claims for imaging services.

### Studying the effects of physician self-referral on the volume or quality of services provided

The effects of physician self-referral may be studied at three levels:

- at the hospital level (e.g., comparing physician-owned specialty hospitals with general hospitals)
- at the market level (e.g., comparing markets with one or more specialty hospitals with markets without specialty hospitals, or comparing markets before the entry of one or more specialty hospitals with the same markets after entry)
- at the physician level (e.g., comparing self-referral physicians with physicians who do not self-refer, or comparing physicians before an incentive or capability to self-refer is introduced with the same physicians afterward)

Researchers use two methods to assess the effects of physician self-referral. The pre-post method compares utilization rates and/or performance on quality measures before and after physician self-referral is introduced. For example, rates at which imaging studies are performed by physicians may be compared before and after the organization within which they work introduces a payment policy that gives physicians a share of the revenues from imaging studies. Similarly, rates of cardiac bypass surgery before a cardiac specialty hospital enters a market may be compared with rates in the market after cardiac hospital entry. When the pre-post difference occurs immediately, is large, and is not obviously attributable to some other change in the physicians' organization or in the market, it is reasonably safe to attribute it to self-referral. However, as is typically the case in studies involving markets, the change over time and the differences among markets may not be large. In this case, researchers try to compare the changes observed with those that would have been expected based on trends over the previous years.

The second method used to assess the effects of physician self-referral makes comparisons between physicians who self-refer and those who do not, between facilities (such as physician-owned specialty hospitals versus general hospitals), or between markets with and without physician-owned facilities. These comparisons may be cross-sectional (such as comparing utilization rates between specialty and general hospitals in a given year) or longitudinal (such as comparing trends in cardiac bypass surgery rates over a number of years between markets which have had entry by one or more cardiac hospitals and markets without such entry).

The validity of this method depends heavily on how well the comparison group is matched to the self-referral group. For example, if physicians refer patients less likely to have complications to their own facilities, while referring sicker patients to general hospitals, the physician-owned facilities will appear to provide higher-quality, lower-cost care. Researchers attempt to compensate for this by risk adjusting for patient factors likely to be associated with complications, but risk adjustment will be inadequate to the extent these factors are incomplete compared to physicians' more detailed, firsthand knowledge of patients. Similarly, cardiac hospitals may enter only markets in which the need for cardiac procedures seems likely to increase (for example, because of an aging population). If this is the case, increasing utilization rates in these markets might be incorrectly attributed to cardiac hospital entry. Researchers sometimes attempt to adjust for this by using a variety of methods to try to "match" markets.

Both the pre-post and the comparison methods described above suffer from a problem common to much social science research: the difficulty of distinguishing correlation from causation. If patients in specialty hospitals are indeed healthier on admission than those in general hospitals, the category "specialty hospital" will be highly correlated with good high-quality outcomes, but this result may not be caused by the specialty hospitals—that is, the good outcomes may not be because specialty hospitals provide superior care. Studies attempt to minimize this problem by risk adjustment or by attempting to match the self-referral group to a comparison group that appears to be as similar as possible. The ideal approach would be a randomized, controlled trial that would assign patients to specialty hospitals or general hospitals, or assign entry of cardiac hospitals to entering individual markets. Unfortunately, for obvious reasons, such studies cannot be done.

When studying specialty hospitals, researchers have the advantages that a great deal of data is available and that serious adverse events are relatively common (and therefore can be used as measures of quality). It is much more difficult to evaluate quality when such events are rare (as in ASCs, hospital OPDs and physician offices).

When studying either utilization rates or quality attributed to physician self-referrals, it is important to know the extent to which the services being provided are appropriate—that is, medically indicated. Simply showing that utilization rates have increased is not enough, since there may have been under-provision of services—perhaps due to lack of capacity—before physician-owned facilities entered a market. Sudden and very large increases, however, should probably be attributed to over-utilization, unless it is very clear that there was under-capacity in the market prior to the entry of a physician-owned facility. Attempts could and probably should be made to evaluate clinical appropriateness by reviewing charts, though even with this expensive and labor-intensive process there is a problem in clearly distinguishing medically indicated versus non-indicated services.

Finally, in analyzing the effects of physician self-referral, it is important to consider the broad context. For example, consider the following hypothetical but plausible scenario:

- Primary care physicians who self-refer for x-rays of the extremities within their offices are more likely to order these x-rays than primary care physicians who refer patients to an outside, non-physician-owned facility where x-rays are interpreted by radiologists.
- Some of the additional x-rays ordered by primary care physicians may not be necessary.
- Even with their direct knowledge of where the patient's pain is, primary care physicians are somewhat less accurate in their interpretation of x-rays of the extremities than radiologists.

A first order study of this subject would find that primary care physician self-referral leads to higher-costs and lower-quality. However, it is possible that:

- The primary care physician's interpretation of extremity x-rays is 95 percent as accurate as the radiologist's interpretation.
- The ability to diagnose and treat patients immediately, without patients' having to travel or experience delays in obtaining radiology results, leads to lower costs and higher quality for the 95 percent of patients for whom the primary care physician's diagnosis is correct.

In this case, studying the broader context might lead to different conclusions and different implications than the first order study. For example, rather than prohibiting in-office self-referral for x-rays of the extremities, it could be required that primary care physicians submit all x-rays to radiologists for a second reading. In this case, the radiologist, not the primary care physician, would be paid the professional fee, but the primary care physician office would be paid the facility fee for performing the x-ray.

### Studying the effects of physician-owned facilities on general hospitals

General hospitals' profit margins are affected by a large number of factors, so attributing changes in these margins to the presence of physician-owned facilities is difficult, if not impossible. Furthermore, though margins for hospitals overall—even within a single market—might not change after one or more specialty hospital enters, individual hospitals could be significantly affected. This would not be evident in the usual large-scale regression analyses performed to evaluate this question. Case studies may provide much more in-depth information, but have the disadvantage of not being generalizable. Furthermore, even a well-done case study may find it difficult to evaluate the extent to which a hospital's profit margin is down because of a nearby specialty hospital versus the extent that it is down because the hospital is not well managed.

Even more difficult than evaluating the effects of physician-owned facilities on general hospital profit margins are attempts—few of which have been made—to evaluate the effects of these facilities on the strategic and operational policies of general hospitals. If a general hospital decides to expand its cardiac surgery service line, is that primarily because of the arrival of a specialty hospital? This would be difficult to know, perhaps even for the hospital administrators who make the decision. Similarly, it will be difficult to learn whether a general hospital that closes its mental health services is doing so primarily because the entry of a cardiac hospital has reduced the general hospital's revenues from cardiac surgery.

### Lack of data

The difficulties with identifying physician-owned specialty hospitals and ASCs, and physician financial relationships with IDTFs, have been noted above, as has the extreme difficulty in identifying the physician owners themselves. Data also are lacking in two other important areas.

First, though a great deal of physician self-referral occurs in physician offices—for imaging, surgical and endoscopy services—very little data are available on this subject. It is possible to identify the occurrence of the procedures by using claims, but difficult to obtain any data on the outcomes of the procedures.

Second, most studies of physician self-referral use Medicare claims data because it is the only data generally available to researchers and includes large numbers of patients for any given physician or facility. The effects of physician self-referral for patients other than Medicare patients are also important to evaluate, but researchers have been able to do so only when they gain access to a proprietary data set, such as the data set of a particular health plan. These data sets are usually limited both in the number of patients involved and in the geographic area covered.





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